

Docket No. 1759.011

**REMARKS**

This application is a U.S. National Phase filing under 35 U.S.C. § 371, claiming priority from International Application No. PCT/FR99/00748, filed on March 31, 1999, and French Patent Application No. 98.04401, filed on April 3, 1998. Claims 1-23 were originally filed with the application; claims 12, 22 and 23 were canceled, and new claims 24-28 were added by a preliminary amendment filed with the application. In response to a restriction requirement, the invention of group I, claims 1-11 was elected. The inventions of Groups II, III and IV, claims 13-28 have been withdrawn from consideration. Therefore, claims 1-11 are currently pending.

Rejections of the claims are addressed below in the order raised in the outstanding Office Action.

**Rejections Under 35 U.S.C. § 112**

The Office Action states that the objections and rejections under 35 U.S.C. § 112, second paragraph, have been withdrawn.

**Rejections Under 35 U.S.C. § 103**

The rejection of claims 1-11 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,616,532 (Heller), in view of WO 97/00134 (Kimura) has been maintained. The rejection is again traversed.

Heller discloses a photocatalyst composition containing titanium dioxide and colloidal silica (Example 14), but, as noted in the Office Action, does not disclose a composition containing silica particles having the claimed surface area. Kimura discloses a photocatalyst-carrying structure wherein an adhesive layer is provided between a photocatalyst layer and a substrate (Abstract). The adhesive layer functions to "strongly glue a photocatalyst onto a substrate" (col. 3, line 21). The Kimura reference is cited in the application, and the drawbacks of its use of an adhesive layer to bind the photocatalyst to the substrate are set forth on page 4, lines 1-7: "In other words, this solution has the drawback, on the one hand, of increasing the number of steps needed to manufacture a filtering medium (coating of two successive layers on the support), and on the other hand, of using resins, which are by definition organic, which can

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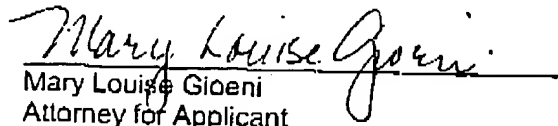
be consumed during the photocatalysis process." The present invention solves these problems by providing a photocatalytic composition that is simple to prepare and may be coated directly on a support (page 4, lines 9-12). Claim 1 is now amended to clarify and emphasize the distinction between the present invention and the prior art as represented by the Kimura reference. The amended claim recites a "photocatalytic composition comprising at least one photocatalyzing agent **bound to a support by means of an inorganic binder** derived from an aqueous colloidal dispersion comprising from 20 to 50% by weight silica particles having a diameter of between 10 and 50 nanometers and a specific surface area greater than 80 m<sup>2</sup>/g." (Emphasis added.) Support for the amendment may be found on page 4 of the specification.

The Office action observes that Heller does not disclose the claimed specific surface area of the inorganic silica binder. With respect to Kimura, while a silica particle having a specific surface area after drying of 180 m<sup>2</sup>/g is disclosed (Metal oxide sol Z-1, Cataloid SI-30, col 19, line 32), applicants suggest that one of ordinary skill in the art would find no motivation to use this material in a photocatalytic composition for bonding a photocatalyst to a support, as required by the claims. This is because the reference leaches away from using silica to adhere a photocatalyst to a substrate in at least two passages. At column 2, lines 15-23, Kimura states: "Whereas, for carrying a photocatalyst onto a glass fiber paper, a method to use a metal oxide sol as an adhesive has been proposed. (Citation omitted.) However, the adhesive property of a metal oxide sol, such as silica sol, is very weak because it is derived from van der Waals [sic] force (citation omitted) so that the binding strength and durability of the adhesive were insufficient." In addition, as pointed out in the response to the previous Office Action, the undesirable effects of coating a photocatalyst composition including titanium dioxide and silica sol directly on a substrate, without an intervening adhesive layer, are shown in reference Example 1 of Table 1, and described in col. 21, lines 30-36. "In reference example 1, a structure carrying a photocatalyst layer without providing an adhesive layer is given. In this case, the photocatalyst layer has no sticking property and is easily defoliated. Furthermore, after durability test, the surface of polyester film deteriorated due to a photocatalytic effect, and holes and cracks were observed on the film."

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Applicants submit that because of this negative teaching of Kimura, the deficiency of the Heller reference with respect to the specific surface area of the silica binder is not supplied. Therefore, claim 1 as amended and claims 2-11 which depend from claim 1, are not obvious over the combination of the references. It is believed that the rejection is hereby overcome.

**Respectfully submitted,**

  
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